National Library of Canada
Bibliothèque nationale du Canada

Canadian Theses Service
Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

NL-339 (r. 88/04) c

Canada

UNIVERSITY OF ALBERTA

VOCABULARY ACQUISITION THROUGH SHARED READING EXPERIENCES

BY

MONIQUE SENECHAL

—

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR IN PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

EDMONTON, ALBERTA

FALL 1990

National Library of Canada
Bibliothèque nationale du Canada

Canadian Theses Service
Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-64777-9

Canada

University of Alberta

Release form

Name of author: Monique Sénéchal

Title of thesis: Vocabulary Acquisition through Shared Reading Experiences

Degree: Doctor of Philosophy

Year this degree granted: 1990

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific purposes only.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

M. Sénéchal

Monique Sénéchal

11 - 3205 Linton Avenue
Montréal, Québec

Date: 26 September, 1990

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Vocabulary Acquisition Through Shared Reading Experiences submitted by Monique Sénéchal in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Dr. E. H. Cornell

Dr. J. Bisanz

Dr. G. L. Bisanz

Dr. G. Malicky

Dr. G. J. Whitehurst

Date: 26 September 1990

To my parents with love and gratitude

Abstract

This study was designed to assess whether preschool children learn new vocabulary from a single reading of a storybook. This research was also an investigation of whether certain conversational devices used by parents during joint book reading facilitate vocabulary growth. Specifically, the study was a test of whether children learn more when they are actively involved during storybook reading. Eighty 4- and 80 5-year-old children listened to a story. The narrative was constructed to introduce ten target words not typically known to young children. Children were pretested for their receptive knowledge of the vocabulary words, were posttested immediately after the reading, and were posttested again one week later. Both age groups were able to recognize approximately the same number of words on the immediate posttest. However, after one week 5-year-old children remembered more words than the 4-year-old children. A simple reading of the book was as effective for teaching the target words as asking the children to label pictures illustrating the target words, having the reader use recasts of the target words, or repeating the target words. Thus, although learning was robust, there was no evidence of differential learning of vocabulary under different conditions including active participation. An expressive vocabulary test revealed that a single reading of a storybook was not sufficient to boost children's production of target words. The fact that 4- and 5-year-old children learned in all conditions

has a reassuring implication for parents: Children acquire new receptive vocabulary in a variety of reading interactions.

Acknowledgment

I want to thank my teachers, Edward Cornell, Jeff Bisanz, and Gay Bisanz. My thinking has been greatly influenced through many nourishing interactions with them. I am indebted to Grace Malicky and Russ Whitehurst for their valuable comments on earlier drafts of this thesis. I also thank Donald Heth for his amazing ability to answer even my most obscure statistical questions. Sincerest thanks to Wanda Rowat for help in data collection and to Georgina Burstow for her caring support. Finally, I am especially grateful to Michael Taylor for his loving encouragements and timely addition of an element of competition: I congratulate him on becoming a doctor first.

TABLE OF CONTENTS

INTRODUCTION 1

Evidence from Case Studies and Observational Studies 2

Evidence from Correlational Studies 5

Evidence from Experimental Research 6

Rationale 9

METHOD 19

Subjects 19

Storybook and Target Words 20

Design 21

Dependent Measures 22

Procedure 26

Pilot test 28

RESULTS 30

Preliminary Analyses 30

Receptive Vocabulary 31

Expressive Vocabulary 39

DISCUSSION 41

REFERENCES 50

APPENDIX 60

LIST OF TABLES

TABLE 1. Mean Duration (and Standard Deviations) in Seconds of Book Reading Episodes in each Reading-Practice Condition 48

TABLE 2. Mean Number of Words Correct (and Standard Deviations) on the Receptive Vocabulary Tests for each Age Group 49

INTRODUCTION

Learning new vocabulary is a major part of acquiring language (Clark & Clark, 1977). The process of learning new words starts from infancy and continues throughout one's lifetime. Six-year-old children know about 8,000 root words of English (Carey, 1978). If a child knew about fifty words at eighteen months, then that child has learned nearly 8,000 words in four and one-half years, or an average of five new words per day (Read, 1980; Templin, 1957). To account for this tremendous increase in vocabulary, some researchers have postulated that the words learned by preschool children reflect parental naming practices (Anglin, 1977; Clark, 1979, 1983; Danziger, 1957).

There has been a growing interest in determining how and where children acquire new terms (e.g., Valdez-Menchaca & Whitehurst, 1988). Specifically, the focus has been on home environments that promote the acquisition and the elaboration of word meanings. A primary activity associated with vocabulary development has been picture-book reading episodes between an adult and a child (Durkin, 1974-1975; Wells, 1986). Book reading is assumed to be effective for teaching labels because it is highly repetitive and narrows down possible meanings of words by showing specific illustrations (Ninio & Bruner, 1978; Snow & Goldfield, 1983). During book reading episodes, parents can introduce new words and also test the children's recall of the new information.

Consider a typical interchange as a young child and her father are

reading a book together. The young child encounters an illustration of a word or concept that she does not know. "What's that?" she asks as she points to the pictured object. The father uses the illustration to label and describe the functions and the attributes of the object. The book organization may be such that when the father turns the page, he can take advantage of a new illustration of the target object to ask the same question as that posed by the child: "What's that?" The repetition in a new context serves to reinforce learning (Cornell, Sénéchal, & Broda, 1988).

Recent studies have shown that through their interaction with adults during joint book reading, young children not only participate in an enjoyable and interesting activity but also may develop language abilities and literacy skills (Ninio & Bruner, 1978; Snow & Goldfield, 1983; Snow & Ninio, 1986; Teale & Sulzby, 1986; Wheeler, 1983). The practices and effects of reading to preschool children, as well as children's re-enactments of books frequently read, were first noted in observational and correlational studies (see Teale, 1981 for a review).

Evidence from Case Studies and Observational Studies

Evidence from case studies has shown that young children who frequently had books read to them knew how to handle books, knew which was the front of a book, knew that print, not illustration, was to be read, and knew the appropriate direction for reading the print (Doake, 1981; Snow & Ninio, 1986).

In an attempt to identify events in one-to-one readings that might lead to such knowledge, naturalistic observations were conducted to document how children and parents interact when reading storybooks. Descriptions included both the quantity and the quality of book reading interactions. The type and amount of verbal interaction between adult and child during story reading was the initial focus, largely because of the interests of developmental psycholinguists (Flood, 1977; Heath, 1982; Ninio, 1980; Ninio & Bruner, 1978; Teale, 1981; Teale & Sulzby, 1986). For example, Roser and Martinez (1985) observed imitation of language by four children over ten months during book reading activities at home and at school. The children tended to respond more like the adult who read than like other children. If the parent talked more about the illustrations, children, in turn, would talk more about illustrations. Adults might recognize that book reading encourages imitation of new linguistic forms. Extended observations showed that maternal speech was more complex during such reading routines than during free-play with toys (Snow, 1983).

Observational studies also emphasized the personal and ideographic nature of the learning process during joint book reading; parents read to their children in qualitatively different ways (Ninio, 1980; Teale, 1984). The interactive behaviors of adults varied depending on the age of the child and the socioeconomic status (SES) of the family (e.g., Anderson, Teale, & Estrada, 1980; Heath, 1982). For example, parents tended to

read the book in a single sitting when their children were around three years of age (Snow & Ninio, 1986). Children also began to recite large segments of the text in a language that was either verbatim or had prosodical features (Sulzby, 1985). When the child was three, he or she might be expected to listen to the story and learn from the information contained in the book in order to respond to the adult's questions (Heath, 1982). Book reading behaviors also appeared to differ according to the family setting. For example, Heath (1980) found that in middle-class homes, answers to why-questions and affective comments were frequently sought, whereas in lower SES settings, when- and what-questions were the rule.

These findings have raised the possibility that different reading practices might have differential consequences for children (Teale, 1981, 1984). In fact, many researchers have proposed beneficial ways in which parents should read to their children. According to Holdaway's (1979) model of teaching derived from observations of middle-class homes, children benefit most when they are asked to respond and the adult only offers information when necessary. Snow (1983) has given broader recommendations; she described three parental procedures assumed to facilitate language development. Parents should use extensions and ask clarifying questions to continue discussion on topics introduced by the child. Parents also should structure their dialogue to facilitate comprehension and request the best answer the child can provide.

Central to these recommendations has been the idea that it is through the social interaction between a learned adult and a child that learning occurs (Vygotsky, 1978). A common assumption has been that to be effective, the reading styles of parents must ensure active participation from the children (Holdaway, 1984; Wells, 1985).

Although intuitive, the beneficial effects of these different reading practices have yet to be demonstrated experimentally. An unelaborated rereading of a word might be sufficient to stimulate its entrance into the child's vocabulary. Nor has it been demonstrated experimentally that children learn more from joint book reading episodes in which they actively participate. A child might learn by quietly listening to and observing the actions of the reader.

Evidence from Correlational Studies

Correlational evidence has shown that children who learned to read before going to school were read to often at home (Clark, 1984; Durkin, 1966; Morrow, 1983; Sutton, 1964; Teale, 1978). Children who had a desire to learn to read and subsequently became successful readers also had been read to at home (Durkin, 1974-1975; Holdaway, 1979; Moon & Wells, 1979). Development of syntactic complexity and increased vocabulary were also associated with early experiences of being read to frequently (Chomsky, 1972; Irwin, 1960; Templin, 1957). Listening to stories during the preschool years was related to teacher's assessments of vocabulary size at age 10 (Wells, 1986). Moreover, parents' use of superordinate

category labels during picturebook reading was positively associated with children's performance on taxonomic tasks (Watson, 1989). There has been a strong assumption in the literature that joint reading activity in the preschool years made an important if not necessary contribution to reading achievement (Mason & Allen, 1986).

Nevertheless, correlation does not imply causation. A child's early reading abilities or interest in reading might be the result of events that covary with joint book reading, such as the language and the cultural activities occurring in homes of particular social economic status. Additional interpretative problems associated with the correlation between parental reading practices and early reading abilities by their children are not atypical of preliminary ethnographic descriptions. Most of these investigations have been done with only a few children, making generalization difficult. Finally, the ethnographic approach is purposely not invasive. Practices in the homes are not altered in an attempt to directly examine the consequences of being read to (Teale, 1981).

Evidence from Experimental Research

Only recently have there been experimental studies to establish causal links between being read to and various effects (Eller, Pappas, & Brown, 1988; Feitelson, Kita, & Goldstein, 1986). Morrow (1988) investigated the effects of story reading on low SES children. Children were randomly assigned to one of three groups. In one group children were read each of three books three times, in another group children

were read a different book for each of the nine sessions, and the control group worked on readiness programs. The readers interacted with the children, prompting them for responses, giving support, information, and feedback. After the reading, children were asked to reread the book or share comments or questions. On the tenth week, all children were read a book and their behavior during book reading was recorded. Overall, the two treatment groups asked more questions and made more comments than the control group.

Although assessing the frequency of usage of questions and comments was interesting, the children's acquisition of the vocabulary and the content of the books was not assessed. In addition, all the stories involved characters and concepts familiar to kindergarten children; the acquisition of new information was not the primary interest. This highlights the selectivity in analysis of dependent measures in different experimental studies. Storybook reading can be for the purpose of social interaction, aesthetic appreciation, or the teaching of language or new information.

Didactic techniques that parents and/or teachers use when they read to their children were also examined. Young elementary school children made greater vocabulary gains when the reader of the storybook gave short explanations (e.g., synonyms) of target words during reading compared to children who simply listened to the story (Elley, 1989). The effects of repeated readings of books and of questioning during book

reading events were investigated by Cornell, Sénéchal, and Broda (1988). Three-year-old children were read storybooks in which an event could be anticipated from the preceding page. After the first reading of the books, children were either reread the book with questions prompting children to recall the to-be-remembered items, or were simply read the book for a second time, or children played with a puzzle. Children were read the books a last time and the reader prompted them to recall the items. Both questioning and repetition facilitated recall of the picture book items more than a single rendition of the storybook. In this study, the items to be recalled were familiar to young children. An extension of this study is to examine whether repetition and questioning techniques have memorial effects when the items to be remembered are new to children, as in the case of vocabulary acquisition.

The relation between early reading and children's linguistic development was studied by Whitehurst, Falco, Lonigan, Fischel, DeBaryske, Valdez-Menchaca, and Caufield (1988). One group of middle-class parents were trained to encourage their two-year-old children to talk more through the use of wh-questions and open-ended questions, to give praise and corrective feedback, and to repeat, expand, and recast the child's speech more often. Whitehurst et al. (1988) found that the treatment group used more praise, expansions, and open-ended questions whereas the control group used more yes/no questions, reading/conversation, and directives requesting for nonverbal action.

The children in the treatment group made impressive gains on tests of expressive vocabulary (not on tests of receptive vocabulary) compared to children in the control group. The implication is that changes in parental behavior during reading episodes could have substantial positive effects on children's language development.

The Whitehurst et al. (1988) investigation directly addressed the issue of whether variations in parental reading affect children's language development. However, it is impossible to know which parental behaviors contributed to children's learning because the intervention program was designed to enhance broad changes in the parents' reading behaviors. This shortcoming highlights the need for specificity in the analysis of independent measures in different experimental studies.

Rationale

The research herein was an investigation of whether a single reading of a storybook between an adult and a preschool child could be sufficient to produce vocabulary growth. Moreover, the research was an investigation of whether certain conversational devices used during joint book reading could facilitate children's vocabulary development (e.g., Ellis & Wells, 1980; Nelson, 1977, 1981). The study was designed to test the assumption that a child learns more when an adult requests active participation from the child during book reading episodes (e.g., Flood, 1977; Holdaway, 1984; Pelligrini, Perlmutter, Galda, & Brody, 1990). It

also was designed to test whether the beneficial effects of certain adult reading styles interact with the age of the children. Active verbal participation might boost 5-year-old children's learning, but simply listening to interpretative remarks by parents might boost 4-year-old children's learning. However, children might learn new vocabulary entries from context, with only the support of the text and the illustrations.

The criteria for selection of adult reading behaviors were that the behaviors occurred in natural settings and that the behaviors varied in the degree of child participation requested. Four behaviors were selected: the use of what- and where-questions (Whitehurst et al., 1988), the use of recasts (Baker & Nelson, 1984), reading the text as presented but emphasizing certain words by repeating them, and reading the text as presented (Heath, 1982). The age of the children was selected on the basis that the reading styles tested in the study have been observed in ethnographic studies of parents reading to their preschool children.

In the study, children were read a storybook. Embedded in the narrative were ten target words that were typically unfamiliar to children of these ages. However, children of that age typically knew the synonyms for these words. For example, 4-year-old children usually did not know the word infant, but did know its synonym baby. Thus, the task was one of incidental learning where children were expected to acquire new labels for concepts that were already known. The new label was

introduced in the text and the concept was pictured in the book. The illustration might serve as an example so that the child could associate this new label with the familiar concept. Moreover, the new label was more or less emphasized during the reading of the book depending on the adult's reading behaviors.

Questioning. Parents use a variety of questioning styles when they read to their children. Some ask what- and where-questions, others ask why-questions, and still others ask open-ended questions (Wheeler, 1983). The positive effects of questions when reading books to young children have been established in a few studies. Cornell et al. (1988) found that 3-year-old children anticipated storybook events from page-to-page after being questioned about book content during a previous reading. Morrow (1984) found that the comprehension of kindergartners was better when they were asked questions either about the structure of the story or about facts presented in the story compared to children who were only read the book. However, with four-year-olds, questioning did not improve recall of attributes of words but the questioned subjects paraphrased recall more than children in the control condition (Wood, Pressley, Turnure, & Walton, 1987).

The memorial effects of questioning have been documented within a verbal learning paradigm. Questioning improved 5-year-old children's incidental learning of paired associates (Pressley & Forrest-Pressley, 1985). In addition, 5-year-old children's recall was superior when

children were asked to respond to what- and why-questions than when they were asked to repeat a sentence containing the associates or answer yes-no questions or listened to questions without being able to answer them (Buium & Turnure, 1977; Turnure, Buium, & Thurlow, 1976).

The questions used in the present study were what- and where-questions. Recent evidence has shown that wh-questions written in storybooks did not help children make gains on standardized vocabulary tests (Whitehurst, Fischel, Arnold, Lonigan, Valdez-Menchaca, & Caufield, 1989). However, these results do not exclude the possibility that wh-questions might boost the acquisition of specific words.

The correct answers to the labeling questions used were the new vocabulary words. For example, the child heard the sentence: 'Zoe the cat is reposing'. At the same time the reader pointed to the illustration of a cat lying down. Immediately, the child was asked: 'What is Zoe the cat doing?'. The text was structured in such a way that the target word was the last or penultimate word in the sentence. In response to the questions, a child might answer with the target item, might answer with a synonym of the target item, or might answer incorrectly or give no answer.

When a child answered with the target item, the child essentially repeated the last word or one of the last words heard. This strategy would be correct in most instances. In essence, the child would be

imitating the reader. Using this echolalic strategy, the child would have practice at retrieval (Speidel & Nelson, 1989). Moreover, a child might also infer that something in the picture corresponds to reposing. The child was using her interpretation of the picture and/or the text to construct a meaning for the word (or to simply answer the question). Past research has demonstrated that children are capable of pairing a novel label with a referent on the basis of very limited exposure (e.g., Dollaghan, 1985).

In order to respond the child might look at what the reader pointed to, retrieve what the cat was doing in his or her own words, and then associate that meaning with the new word. For example, the child might associate reposing with resting or with lying down. In this instance the child might say a synonym for the target word; a strategy akin to recasting. Nelson (1977) has argued that recasts gave children a chance to make comparisons between linguistic structures already acquired and new structures. Thus, accepting synonyms as responses might provide a test of whether children benefit more when they actively participate by giving synonyms rather than simply listening to the reader give the synonyms (recasting condition).

The child might also refuse to respond or give an incorrect response possibly because one instance of labeling might not be sufficient to associate the target word with the illustration. Following a failure to respond, the reader simply repeated the target item.

Questioning might have differential effects depending on the ages of the children. The 4-year-old children might not be able to benefit as much from the questioning, because they have difficulty in recall of newly presented materials and tend not to respond to interrogatives in these circumstances (Cornell et al., 1988). The 5-year-old children might be more likely to enrich their representation of the new lexical items by their more frequent overt responding to questions that encouraged description of the items.

Recasting. Recasts occur naturally when mothers interact with their young children (Cross, 1978; Hoff-Ginsberg, 1986; Nelson, Denninger, Bonvillian, Kaplan, & Baker, 1984). A recast builds directly on the previous utterance, changing one or more of its components, i.e., subjects, verbs, or objects (Baker & Nelson, 1984). For example, the child says: "Here's a frog". The mother replies: "It's a big, green frog". The mother's recast maintained the same meaning as the child's utterance but added adjectives.

Nelson (1977) has argued that recasts are beneficial because they gave children a chance to make comparisons between linguistic structures already acquired and new structures. Recasts significantly enhanced the acquisition of previously unused syntactic forms, for example, the use of more complex verbs and questions (Nelson, 1981).

Typically, recasts occur when an adult changes a child's preceding utterance. However, Baker and Nelson (1984) have demonstrated that

recasts did not have to be contingent on the children's utterances to be effective; children's acquisition of specific syntactic forms was also facilitated when adults recasted their own sentences. Moreover, recasts were also beneficial when embedded in storybooks (Baker, Pemberton, & Nelson cited in Pemberton & Watkins,1987)

Recently, Pemberton and Watkins (1987) examined the use of recasts on 3- and 4-year-old children's vocabulary acquisition. Children were read stories containing recasts. Comparisons of pre- and posttests showed that children acquired a significant amount of words as a result of being read the modified stories. However, the lack of a control group rendered the results ambiguous: Was learning a result of recasting or a result of repeated exposure to the book (the children were read the story 6-7 times)?

The recasts used in this study involved modification of the target items. The children first heard a sentence with the target item. Then children heard a synonym of the target item. For example, the first sentence included the target word reposing and the recast included its synonym resting. The synonyms in this condition were easier words than targets because they were assumed to be part of the children's vocabulary. Thus, the synonym might enable children to compare the meaning of a known word with the unknown word. This comparison process between known and unknown has been the central component of recasts. Even though recasts typically proceed from the known to the

unknown, presumably children should be just as able to compare unknown information with known information.

Children might only have partial knowledge or no knowledge of the synonyms, and this might hinder their performance. A pretest of the children's knowledge of the synonyms enabled the assessment of the relative effectiveness of the recasts. If recasts indeed facilitate comparisons between acquired labels and new labels, then both 4- and 5-year-old children might learn particularly well with this teaching device.

Word repetition. The reading of the storybook verbatim with emphasis on the target words served as a control condition. The emphasis was provided by repeating the sentence containing the target word immediately after the first reading of the sentence. This manipulation gave children a second opportunity to associate the label with the referent. This condition allowed a test of whether a single repetition of the target word, in the context of its sentence and illustration, was sufficient to ensure learning.

Verbatim reading. Parents sometimes read storybooks without deviating from the text or requesting active participation from children; children were expected to listen to the story in the words of the author (Heath, 1982). Vocabulary acquisition might occur in such exposures as the child attempted to comprehend meaning. The meaning of new words might be apparent in the context of the author's sentence and/or the

accompanying illustrations. The reading of the storybook verbatim served as another control condition. It allowed a test of whether children learned just as well from a single exposure to the target items with only the support of the story and the illustrations to convey the relation between the label and the referent.

A single reading of the book was expected to be the least effective condition for learning new lexical items. For both age groups, inferring meaning from the author's contextual cues might be more difficult than the understanding prompted when parents used questions or recasts.

In the present study, adjunct questions might be largely rhetorical; they asked for information that was likely known by children independent of the text. The retrieval of the answer and the reinforcement of children's verbalizations served to associate children's knowledge with the new term. Similarly, recasts used simplified language that was more likely to be familiar to children. The association of the new term with known terms was the basis of the learning of synonyms. Thus, both age groups should profit from the "scaffolding" inherent in the extratext interactions (Deloache & DeMendoza, 1987; Wood, Bruner, & Ross, 1976). Although the older age group might not need as much external support because they have more knowledge to use to interpret verbatim readings, it was expected that they would not learn as many terms in the control conditions as in the conditions with extratext interactions.

In summary, this study was designed to assess whether children learned new vocabulary from a single storybook reading episode, and to assess the relative contribution of specific teaching behaviors that parents use when they read to their children. Older children were expected to learn more vocabulary items than younger children. Adult reading practices were expected to interact with the age of the children. As previously discussed, the older age group was expected to learn more items than the younger age group when the adults asked wh- questions or read verbatim, whereas the age differences may disappear when adults used recasts. Reading the text verbatim was expected to be the least effective reading practice for both age groups because children were not encouraged to participate during the reading. The retention scores were divided into various conditionalized measures to assess the amount of prior knowledge, of acquisition, of remembering, of forgetting, and of guessing. Moreover, the analysis of different dependent measures could indicate processes underlying the learning that occurs when parents use different styles of reading.

METHOD

Subjects

Eighty 4- and 80 5-year-old children completed the experiment. The mean age for the 4- and 5-year-olds was 49 (range: 44-53) and 62 (range: 57-66) months, respectively. An additional 15 children were absent from school for the second posttest and were replaced. One child refused to participate and another child made four errors on the pretest for synonyms. These two children were also replaced. Within each age group, equal numbers of males and females were assigned randomly to each condition.

Children were recruited from local daycares, nursery schools, and kindergartens. Parents were interviewed to determine the extent to which children had been read to at home and also to determine the socioeconomic level of parents (Hollingshead, 1975). Middle-class or upper-middle class families who spoke English in the home were selected to participate to reduce the variation in home book reading experiences (Snow, 1983; Heath, 1980). A middle-class family was defined as one scoring three or more on the Hollingshead (1975) 5-point scale. The scale is a weighted average of both parent's educational levels and occupations. Socioeconomic status (SES) for 12 families was not available, either because parents refused to give the information or because families moved away. Children from these families were not replaced because the other families from the same schools or daycares

were middle-class.

Selecting middle-class families reduced the generality of results, although it is unlikely that the processes of learning (unlike the styles of reading) varies in different socioeconomic-status homes.

Storybook and Target Words

A commercially available picture-book, Just in Passing (Bonners, 1989), was selected because the story structure consisted of the repetition of a similar episode: A person saw someone yawn, and, in turn, yawned while being observed by still another person. This episode was repeated twenty-five times, thus allowing the introduction of target items at relatively similar levels in the story structure. This structure prevented target words from being differentially memorable because some might be more important to the narrative. The picture-book did not have a text. Thus, a text was constructed to accompany the colored illustrations and to introduce the target words. The text is presented in Appendix.

Ten target words were selected with the assumption that they not be known to 4- and 5-year-old children. The target words (and synonyms) were: angling (fishing), corridor (hall), elderly (old), gazing (looking), infant (baby), lineman (repairman), reposing (resting), sash (window), satchel (purse), snapshot (picture). To ensure that these target words were probably not known to children, the frequency of occurrence of the words in adult written material was assessed. The words seldom appeared in written material; the mean frequency of occurrence of the

target words was 4.25 times per million words (Range = 1 to 13). The target words corridor and snapshot were not in the Kučera and Francis (1967) tables but the words corridors and snapshots were. The frequencies used were for the latter words. The word satchel was not in the tables. In addition, children were pretested as to their knowledge of the target words. The results of the pilot study showed that children typically did not know the target words on pretest.

Design

The experiment was a 2 (Age: 3 vs. 5) x 4 (Reading practice: questioning vs. recasting vs. word repetition vs. verbatim reading) factorial design. Children were pretested for their knowledge of the synonyms of target words, for their knowledge of target words, and were posttested for their knowledge of target words immediately after reading the book and again one week later.

The four reading conditions represented a continuum requiring decreasing amount of participation from children. In the questioning condition, children were asked what- and where-questions when target words were introduced. In this condition, verbal participation was encouraged by asking children to label the target items. In the recasting condition, the adult read the sentence introducing the target item, and then repeated the sentence but replaced the target item with a synonym. It was assumed that recasts would prompt children to make mental comparisons between an unfamiliar target item and a familiar synonym

for that word (Baker & Nelson, 1984). The synonyms were assumed to be part of the children's lexicons. This assumption was verified by pretesting children's knowledge of the synonyms. In the word-repetition condition, the adult simply repeated the sentence introducing target words, thus giving children a second opportunity to associate the novel label with the referent. In the verbatim-reading condition, children listened to the story and were not encouraged to participate. Children may have attempted to interpret words in the context of the author's sentences or illustrations, but the reader did not specifically prompt or reinforce this activity.

In addition, it was of interest to assess whether the words that children learned were remembered over an extended period. The children were tested for acquisition immediately after the storybook reading and were tested again one week later.

Dependent Measures

During the book reading, the children had the opportunity to associate a novel label with a referent that was already in their mental lexicon. Learning was defined as the children's capacity to either identify or label an illustration representing the referents introduced in the study phase. Thus, learning was measured by both tests of receptive vocabulary and of expressive vocabulary. The illustrations used in the two tests were different from the ones introducing the new labels. Hence, the children's task was to learn not only the new label but to be able to

transfer the newly acquired labels to different representations of the referent. For example, the label angling was introduced with a picture of a man sitting in a dory and fishing, whereas the test of the label is the illustration of a young girl sitting on a rock and fishing.

Measures of receptive vocabulary. Children's recognition of the target words was used as the index of receptive vocabulary, i.e., words that children could understand but not necessarily produce (Just & Carpenter, 1987).

The use of pre- and posttreatment measures allowed the adjustment of the posttreatment means for pretreatment scores. The retention scores were divided into various conditionalized measures to assess the processes underlying the learning that occurred during the book reading. For example, acquisition was defined as the number of items correct on the immediate posttest given that they were incorrect on the pretest. Other conditionalized measures are defined in the section on analysis of results.

Children were also pretested as to their knowledge of synonyms because in the recast condition it was assumed that children would know the synonyms. Children were not included in the study if they could not identify at least seven of the ten synonyms.

Measures of expressive vocabulary. Expressive vocabulary consists of words children could produce when speaking (Just & Carpenter, 1987). Children were posttested on their ability to label the target items with the

new terms. Children's use of synonyms and children's errors to the expressive vocabulary test were also of interest. The use of synonyms were scored with a liberal criterion. For example, worker was scored as a synonym for lineman, grandpa for elderly, and lying down for reposing. Children's responses that did not correspond to any of the target items were identified as incorrect guesses. Children's failure to answer a probed recall was scored as no response.

The measures of receptive and expressive vocabulary were not unlike classical measures of retention. The expressive vocabulary test was akin to cued recall because the illustrations used in the test served as a probe for retrieval. The receptive vocabulary test was akin to typical recognition tasks where one is asked to identify a previously experienced item from an array of unfamiliar items.

Tests of vocabulary. Three tests of receptive vocabulary were constructed; one for pretesting knowledge of synonyms, one for pretesting knowledge of target words, and one for posttesting knowledge of target words. The procedure and the format of the material used for the three receptive vocabulary tests were similar to those used in the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981). That is, tests consisted of one plate for each target item. Each plate consisted of four illustrations, one representing the target item and three representing distractors. A similar adaptation was successfully used by Pemberton and Watkins (1987).

The illustrations used in the receptive vocabulary tests were copied from Pictures Please: A Language Supplement (Stevenson Abbate & Bartell Lachapelle, 1979). The illustrations were different from the illustrations used in the storybook. The three tests used the same illustrations for the target items. However, the tests for the target items also included plates with illustrations of irrelevant but familiar objects (e.g., coat, ball, and doll). Specifically, a familiar plate was interspersed every second target-item plate. This was to ensure that children could identify some illustrations during testing and thus maintain a reasonable level of interest in the task. Plates of familiar objects were not included in the test of synonyms because the synonyms of target words were assumed to be known to the child. In sum, the receptive test for synonyms consisted of ten plates and the receptive tests for the target items consisted of sixteen plates, i.e., ten plates of target items and six plates of familiar irrelevant items.

To minimize interference among the tests, the position of the four illustrations on each plate was varied across tests and the color of the background cardboard was also varied across tests. The order of presentation of plates was also varied across all tests. In addition, different irrelevant items were interspersed throughout the pretest and the immediate posttest for target items. The material for the immediate and delayed posttests was identical. The order of administration of the two pretests was constant, permitting the child to succeed on the easier

test of synonyms prior to the test of target words.

The expressive vocabulary test consisted of the same illustrations of the target items used in the receptive tests. However, the illustrations were presented individually.

Procedure

Each child participated individually. Two experimenters were involved: The first was blind to the experimental conditions and tested children, the second read the storybook to the children. The procedure consisted of two sessions. In the first session, lasting 25 min, the child was pretested for knowledge of synonyms and target words with receptive vocabulary tests. The procedure was the same as the PPVT-R, i.e., the child was asked to point to a named item. If a child hesitated to respond or said that she did not know the word, the experimenter said that some of the words were hard but to try just the same. The experimenter did not proceed to the next plate until the child made a selection. If a child changed her selection, the experimenter recorded the child's last choice. The child's responses were recorded by the experimenter. Following a brief pause after testing, the first experimenter left the room. The other experimenter read the book and pointed to the illustrations corresponding to each target word. The pointing behavior was repeated every time the experimenter mentioned the target item or its synonym. The pointing was included to ensure that young children attended to and encoded the pertinent information in the illustrations (Miller & Pressley,

1987). In addition, parents use such attention-getting devices when they read to their children (Clark & Clark, 1977; Ninio & Bruner, 1978). The book reading episodes were audiorecorded and the duration of each episode was also recorded. Children's comments during the reading were neither encouraged nor discouraged.

In the questioning condition, the experimenter asked a what- or where-question to the child after the first mention of each target word. For example, after reading the target item reposing, the experimenter asked the child: "What is Zoe the cat doing?". If the child responded with the target word or with a synonym, then the experimenter said: "O.K." and continued reading the book. Synonyms were accepted to allow a test of whether children learned more when they or the experimenter labeled targets with synonyms. If the child responded incorrectly or did not respond then the experimenter labeled and pointed to the target word. In the recasting condition, the experimenter replaced the first mention of the target word with a synonym. For example, the experimenter said: "Zoe the cat is reposing. Zoe the cat is resting." In the word-repetition condition, the first mention of the target item was followed by a repetition of the sentence with the target item. For example, the experimenter said: "Zoe the cat is reposing. Zoe the cat is reposing." In the verbatim-reading condition, the experimenter simply read the text as presented.

After listening to the story, the child was posttested first with the

expressive vocabulary test and then with the receptive vocabulary test for the target words. The first experimenter administered these tests. For the expressive vocabulary test, the experiment placed a card with an illustration of a target word in front of the child and asked: "What is this called?". If the child answered with a synonym or with an irrelevant response, the experimenter then asked: "Can you tell me another name for this?". When a child labeled a target word with a verb when the target word was a noun or adjective, the experimenter asked for clarification, such as: "Yes, but what kind of a person is he (or she)?".

A second session occurred one week after the reading of the storybook, and lasted approximately 5 min. The session consisted of a delayed posttest of knowledge of target words with the receptive vocabulary test. For practical reasons, the delayed test was administered either six or seven days after the immediate posttest. The procedure for the pre- and posttests on receptive vocabulary was identical.

Pilot Test

A pilot test was conducted with sixteen 3.5-year-old children and sixteen 5-year-old children to assess whether the target items, their synonyms, and the procedure were adequate. The materials and procedure were adapted by reducing the number of target words from seventeen to ten words and the youngest age group was changed from 3.5 years to 4 years of age. A second pilot study was conducted with eight 4-year-old children and eight 5-year-old children. The procedure and

materials proved adequate.

RESULTS

Dependent measures were analyzed with 2 (Age) x 4 (Reading Practice) analyses of variance (ANOVAs), multivariate analyses of variance (MANOVAs), or with analyses of covariance (ANCOVAs). Means for the number of words were out of a maximum of ten.

Preliminary Analyses

Preliminary analyses were conducted to verify that the amount of book reading experiences children received in their homes did not vary systematically, and that the duration of the book reading episodes during the experiment did not vary considerably.

Parents were asked to estimate the amount of reading their children received in their homes. The amount of reading children received did not vary as a function of age, reading group, or the interaction of these two variables (Fs < 1). On average, parents (or siblings) read storybooks to their children 6.45 times per week. Thus, there were no suggestions that groups differed in this potentially important way.

The analysis of the durations of the experimental reading episodes revealed significant differences as a function of age and reading practice, $F(1,152) = 7.82$, $MS_e = 140.92$, $p < .01$ and $F(3,152) = 158.08$, $MS_e = 140.92$, $p < .001$, respectively. The interaction between age and reading practice was not significant ($F < 1$). The storybook reading with the 4-year-old children (M = 424 sec) took slightly longer than with the 5-year-old

children (M = 419 sec). The reading times for each reading condition are in Table 1. Although these were significant differences, the average difference between the two ages and between the conditions never exceeded nine percent of the mean total reading time. It seemed unlikely that these differences would affect the amount of learning by children.

Receptive Vocabulary

Pretest. Children were tested to determine that they typically knew the synonyms for the target words and that they typically did not know the target words. Performance on the pretest for the synonyms was high for both age groups, although there were significant differences between the two groups, $F(1,152) = 26.48$, $MS_e = .007$, $p < .001$. The 5-year-old children knew more synonyms than the 4-year-old children (Ms = 9.39 and 8.69, respectively). No other effect was significant (Fs < 1).

Children knew, on average, 1.68 target words on the pretest. There were no systematic differences between ages, reading practices, nor did age and reading practice interact (Fs < 1.75). Thus, children knew most synonyms but knew few target words on pretest.

Immediate and delayed posttests. Children's mean scores on the pretest, the immediate posttest, and the delayed posttest for receptive vocabulary are reported in Table 2. The scores were compared to determine whether children made gains in vocabulary as a result of the reading episode. An ANCOVA using the immediate posttest as the

dependent measure and the pretest as a covariate revealed a significant age effect, $F(1,152) = 4.30$, $MS_e = .023$, $p < .05$. The 5-year-old children made greater vocabulary gains than the 4-year-old children. No other effect was significant ($Fs < 1$). Another ANCOVA using the delayed posttest as the dependent measure and the pretest as a covariate also revealed a significant age effect, $F(1,152) = 8.98$, $MS_e = .026$, $p < .05$. Again, the 5-year-old children made greater vocabulary gains than the 4-year-old children. No other effect was significant ($Fs < 1$).

A third ANCOVA was conducted using both the immediate and the delayed posttests scores as dependent measures and still using the pretest scores as a covariate. The 5-year-old children made greater vocabulary gains than the 4-year-old children, $F(1,151) = 45.65$, $MS_e = .036$, $p < .001$. There were significant differences between the two posttests, , $F(1,151) = 29.77$, $MS_e = .013$, $p < .001$. Children's performance was better on the delayed posttest than on the immediate posttest. No other effect was significant ($Fs < 1$). These results showed that a single shared reading episode was sufficient to boost young children's receptive vocabulary.

Direct comparisons between children's scores on the pretest, the immediate posttest, and the delayed posttest allowed verification of whether children made gains in their vocabulary scores as a result of the

experimental procedure. However, these contrasts did not allow a complete examination of the learning process. Further, the analysis of children's patterns of responses over the pretest and the two posttests allowed inferences about acquisition and retention. The first step in the analysis was to establish that learning had occurred (Runquist, 1983). This entailed combining measures that occurred on the pretest and the immediate posttest. The second step in the analysis was to examine the course of retention by combining measures that occurred on the pretest, immediate, and delayed posttests.

Recall that for each target word in the receptive vocabulary tests, children had to select one illustration from an array of four illustrations. Thus, children could make a correct choice because they learned the word as a result of the reading, they could potentially make a correct choice because they knew the target word before the reading, or make the selection by chance. It was of interest to assess what proportion of the pretest scores were due to acquisition.

Acquisition was defined as the number of items correct on the immediate posttest given that they were incorrect on the pretest. The definition of acquisition did not exclude the possibility that the scores were due to guessing. Thus, it was important to assess whether acquisition scores were superior than would be expected by chance. An empirical guessing score was used to estimate chance because in multiple-choice recognition tests, each alternative does not have the

same probability of being selected as correct (Murdock, 1963).

A conservative guessing estimate would be to use children's correct responses on pretest. This is a conservative estimate because it does not acknowledge for prior knowledge of the target words. Conversely, a lenient estimate of guessing would be to define it as the number of items correct on the pretest but incorrect on the immediate posttest. This is a lenient estimate because it does not acknowledge the possibility that children could obtain a correct response on the immediate posttest by guessing. A reasonable estimate of guessing would be obtained if one could separate prior knowledge from guessing. This was possible because children were posttested twice. Thus, guessing was computed in the following fashion. First, a lenient estimate of prior knowledge was defined as the number of items correct on the pretest and the immediate posttest. Second, a more conservative estimate of prior knowledge was defined as the number of items correct on the immediate and delayed posttests given that they were also correct on the pretest. Presumably, any difference between the first and the second estimate of prior knowledge would be due to guessing. Third, the difference between the two prior-knowledge measures was added to the lenient estimate of guessing to obtain a reasonable estimate of guessing.

Children's acquisition was superior to their tendency to guess (Ms = 2.14 and 0.79, respectively), $t(159) = 10.10$, $p < .001$. Thus, children's gains in receptive vocabulary cannot be accounted for by guessing. Moreover,

an acquisition estimate ($\underline{M}$ = 1.35) corrected for guessing was obtained by subtracting acquistion from guessing.

It was also of interest to examine the course of retention. Conceptually, it was assumed that knowledge in long-term memory was accessible for retrieval on all occasions, including those that occur at some time after acquisition. Conversely, forgetting referred to children's failure to retrieve information that was previously accessible (Runquist, 1966).

Interestingly, children seemed to know words on the delayed posttest that were not previously known on the pretest and on the immediate posttest. This result might either be due to guessing or to a form of reminiscence, i.e., an increment in performance on a subsequent test without an intervening study period (Cooper & Monk, 1976). Children might have needed some time between the storybook reading and the testing in order to be able to transfer their learning to other representations of the concepts. Children might also have had the opportunity to learn the words outside the context of the experiment. Thus, it was also of interest to verify whether children's scores on reminiscence were higher than the guessing scores.

Remembering was defined as the number of items recognized on the immediate and the delayed posttests given that they were incorrect on the pretest. Forgetting was defined as the number of items correct on the immediate posttest but incorrect on the delayed posttest given that they

were incorrect on the pretest. Reminiscence was defined as the number of items correct on the delayed posttest given that they were incorrect on the pretest and the immediate posttest.

A 2 x 4 MANOVAs were conducted including the three measures for the words unknown on the pretest, i.e., remembering, forgetting, and reminiscence. This analysis revealed a significant age effect (Wilks's lambda (3,150) = .932, $p < .01$), but no effect due to reading practice (Wilks's lambda (9,365) = .929, $p > .05$), or to the interaction of age and reading practice (Wilks's lambda (9,365) = .946, $p > .05$). The univariate ANOVAs yielded a significant age effect for the remembering measure ($F(1,152) = 7.98$, $MS_e = .013$, $p < .01$) but not for the forgetting or the reminiscence measures (Fs < 3.35). The 5-year-old children (M = 1.60) remembered more words than the 4-year-old children (M = 1.10).

Children did forget words over the one week period between the immediate and the delayed posttests. There was a significant difference between the acquisition score and the remembering score (Ms = 2.14 and 1.35, respectively), $t(159) = 10.59$, $p < .001$. However, children remembered more words than they forgot words (Ms = 1.35 and 0.79, respectively), $t(159) = 4.59$, $p < .001$. Both remembering and reminiscence (M = 1.38) were significantly different from the guessing score, $t(159) = 4.45$ and $t(159) = 4.71$, ps < .001, respectively. Thus, children knew words on the delayed posttest that could not be accounted for by guessing.

Again, corrected estimates of remembering (M = .56) and reminiscence (M = .59) were obtained by subtracting guessing from each estimate.

Questioning condition. During the reading of the book, children were asked to label the target items and could respond by giving three types of answers. Children could either give the label, a synonym for the label, or an incorrect answer or not respond. Both age groups responded with target words equally as often (M = 2.25), $t(39) = 1.03$, $p > .05$. The 5-year-old children (M = 6.25) responded more often with synonyms than the 4-year-old children (M = 4.15), $t(39) = 2.71$, $p < .01$. However, the 5-year-old children (M = 1.95) responded less often with incorrect information (or failed to respond) than the 4-year-old children (M = 3.15), $t(39) = 2.30$, $p < .05$.

Moreover, children responded with synonyms more often than with target words (Ms = 5.20 and 2.25, respectively), $t(39) = 3.64$, $p < .001$. But children were just as likely to answer with a target word than with incorrect information or failing to respond (Ms = 2.25 and 2.55, respectively), $t(39) = .182$, $p > .05$.

It was of interest to assess whether a child who labeled with a target was more likely to learn the vocabulary word compared to a child who labeled with a synonym or with irrelevant information. A lenient definition of learning was used given the pattern of reminiscence revealed in the previous analyses. Learning was defined as the number of target words known on either the immediate or the delayed posttests

given that the target word was not known on pretest; the two receptive vocabulary posttests were collapsed.

Three derived measures were computed; one for each type of answer given during the book reading. The numerators for these measures were the proportions of correct responses given that children had answered questions with either the new label, with a synonym, or with incorrect information. The denominators were, respectively, the total number of new labels, synonyms, and incorrect information given during the book reading episode.

Children were not more likely to learn a new label after labeling a target word with the new label than with a synonym (*M*s = 2.82 and 3.12, respectively), $t(22) = .235$, $p > .05$, nor were they more likely to learn a new label after labeling target words with targets than when the reader labeled the words (*M*s = 2.82 and 3.02, respectively), $t(30) = .163$, $p > .05$. Thus, imitating the reader did not differentially boost acquisition.

Recasting condition. The pretest for synonyms allowed the verification of whether children were more likely to learn a new label when the synonym for that label was known or not known. As in the previous analysis, the children's scores were collapsed over the two posttests to obtain lenient estimates of learning. Derived scores were again computed. First, the instances of knowing a target word given that the synonym for that word were either known or not known were calculated. Second, these two measures were respectively divided by the

number of synonyms known and the number of synonyms unknown on the pretest.

Children were not more likely to learn the new label when the synonym for the label was known (M = 3.62) than when the synonym was not known (M = 3.04), $t(22) = .69$, $p > .05$. The statistical test was conducted with twenty-three cases because seventeen children got perfect scores on the synonym pretest and hence did not provide variability on the conditionalized measures. This finding indicated that children were not more likely to learn a word when they had the opportunity to compare an unknown target with a known synonym. A final contrast was conducted comparing the questioning and the recasting conditions. Children were as likely to learn a target word when they provided the synonym in response to a question (M = 3.12) as when they listened to the reader give the synonym (M = 3.62), $t(75) = 1.02$, $p > .05$.

Expressive Vocabulary

Children were asked to label illustrations representing the ten target words to determine whether reading practice would have differential effects on children's expressive vocabulary. Children seldom used the target words (M = 0.13) to label the illustrations but favored the use of synonyms (M = 9.03). There was not enough variability in children's use of target words to do statistical tests. A 2 x 4 ANOVA for the use of synonyms did not reveal any effect due to age, reading practice, or the interaction of the two (Fs < 1). Moreover, children seldom made mistakes

(M = 0.68) and seldom said that they did not know the label or failed to respond (M = 0.19).

DISCUSSION

This study was designed to assess whether children learn new vocabulary from a single storybook reading episode, and to assess the relative contribution of specific teaching behaviors that parents use when they read to their children. Embedded in the narrative were ten target words that were typically unfamiliar to children of these ages. However, children of these ages typically knew the synonyms for these words. Thus, the task was one of associative learning where children were expected to acquire new labels for known concepts. The target words were introduced in the text, and the concepts were pictured in the book. The targets were more or less emphasized by the reader of the storybook.

Specifically, the study was a test of the generalization that children learn more when they actively participate in the learning task. This generalization was based on laboratory studies (e.g., Buium & Turnure, 1977), naturalistic observations (e.g., Snow & Goldfield, 1983), and training studies (e.g., Whitehurst et al., 1988). However, the results of this study did not support the active-participation generalization. Contrary to expectation, requesting active participation did not boost learning; reading the book verbatim was just as effective as asking questions. Five potential explanations for these results are elaborated. The explanations are discussed in terms of boundary conditions, i.e., limits on the range of applicability of the active-participation generalization.

First, it is possible that the introduction of new labels in the context of a story was sufficient to produce learning of receptive vocabulary. A child might learn by quietly listening to and observing the lessons provided by the reader. It seems likely that vocabulary acquisition could occur in such exposures as the child attempts to comprehend meaning. The meaning of new words might be apparent in the context of the author's sentence and/or the accompanying illustrations. Four- and 5-year-old children learned just as well from a single exposure to the target items with only the support of the story and the illustrations to convey the relation between the label and the referent. Thus, a first boundary condition might be that active participation does not enhance learning when the context is sufficient to produce learning of receptive vocabulary.

Second, a single rendition of the book might not be sufficient to allow potential differences in performances as a function of reading practice. For example, Cornell, Sénéchal, and Broda (1988) found repetition and questioning effects after two readings of the same storybook. Pemberton and Watkins (1987) found recast effects on vocabulary acquisition after more than six readings of a storybook, and Baker, Pemberton, and Nelson (cited in Pemberton & Watkins, 1987) found recast effects on syntactic development after 36 readings of a single storybook. However, it should be noted that in some home and nursery school situations (i.e., with borrowed books) a single reading is not uncommon. It is of interest

to assess how much learning occurs in such instances.

Third, receptive vocabulary might not be sensitive to different reading practices used by parents whereas other dependent measures might be. For example, Whitehurst et al. (1988) found training effects on measures of expressive vocabulary but not on measures of receptive vocabulary. In fact, Whitehurst and DeBaryshe (1989) have proposed that receptive vocabulary might be more sensitive to variables such as attention and frequency of exposure rather than variables such as reinforcement. It is also possible that active participation might enhance receptive vocabulary acquisition only when the concepts to be learned are new to the children. Recall that the target words used in this study were selected on the assumption that children had some knowledge of the concepts. For example, children might not know the word infant but they knew its synonym baby. In essence, the task was one in which children learned synonyms for concepts already acquired. Children might benefit from active participation only when learning new concepts. For example, using questions and recasts might be helpful when parents are first introducing the concept of color to their children.

Fourth, it is possible that active participation is effective only in conjunction with other teaching practices. For example, questions and recasts might be effective only when paired with corrective feedback.

Fifth, active participation might serve other purposes than learning vocabulary. For example, children might be more motivated to read

when they are actively involved in the reading episode. Evidently, more research is needed to delineate under which conditions active participation is beneficial. Only then will a better understanding of how children learn through joint book reading episodes emerge.

The lack of expected results also warranted an examination of the questioning and recasting conditions. Asking questions did not boost acquisition of new labels. This finding corroborated results obtained by Whitehurst et al. (1989) where wh-questions did not enhance scores on standardized vocabulary tests. However, these findings apparently contradict laboratory studies in which wh-questions facilitated recall (e.g., Buium & Turnure, 1977). This apparent contradiction raised an interesting possibility: Wh-questions might help recall of known information but may not increase the acquisition of new information.

The recast condition was not effective in enhancing learning. This result was unexpected in light of previous research (e.g., Pemberton & Watkins, 1987). However, it seems that in these studies the effects of recasting and of frequency of exposure were confounded. Again, further research is needed to tease out the effects of recasting and of exposure.

Performance on receptive vocabulary tests was generally low (an average of 21% of the words were acquired), and the possibility of floor effects has to be addressed. A floor effect would indicate that the conditions of learning were too difficult for children, an unusual argument given the ubiquity of early book interactions. In addition,

posttest performance exceeded performance on pretest. Moreover, acquisition was superior to guessing. These findings do not support the possibility of floor effects.

Children did learn new vocabulary items. To put the present results in the context of the estimation that preschool children learn an average of five new words per day (Read, 1980; Templin, 1957), then a single reading of a book can account for 27% of that estimate. However, children could comprehend but could not produce these new items. The results indicated that a single reading was not sufficient for acquisition of expressive vocabulary. A possible explanation for the lack of new expressive vocabulary is that children did not have the opportunity to verbalize the to-be-learned words. In all but the questioning condition, children simply heard the target words. In the questioning condition, children could respond to questions with the target word or its synonym. Presumably, responding with targets would provide practice and help later production of the new labels (see Whitehurst & Valdez-Menchaca, 1988). A closer examination of the questioning condition revealed that of the children who produced target labels on the expressive vocabulary test, 44% had answered the questions with targets during the book reading, and 55% had answered the questions with synonyms. Imitating the target words during the book reading was not particularly helpful. However, the fact that children generally did not give target labels on the expressive vocabulary test (even after being prompted) does not allow

strong conclusions from these data.

Children's receptive vocabulary gains were not transitory; they remembered more words than they forgot after one week. The new words could be considered in the child's knowledge base. Nonetheless, after one week the older children remembered more words than the younger children. This indicated that older children might have better retrieval mechanisms for subsequent use of new words because immediate gains were similar for both age groups.

Children's performance on receptive vocabulary tests was better on the delayed posttest than on the immediate posttest. This difference was mainly due to reminiscence (or extra-experimental learning). That is, children recognized words that they did not know on the pretest nor on the immediate posttest, and the number of words they recognized was over and above the index for guessing. Thus, children might have needed some time to integrate the new labels in their lexicons because the illustrations for the posttests were different than the ones in the storybook. For example, the word angling was introduced by a picture of a man sitting in a dory fishing and the picture used during testing was that of a young girl sitting on a rock fishing. Children might have encoded several peripheral details about the illustration during the reading of the book. Thus, their representation of the new word could have been too specific. After one week, details might not be retrieved, and children might see the correspondence to other representations of the

concept. It is also possible that children were more familiar with the test procedure and material and that the reminiscence results are mainly due to testing effects.

Attempts to determine the circumstances under which children's learning is facilitated are important in order to elaborate models of parent-child interaction during the preschool years (Teale, 1982). However, the fact that 4- and 5-year-old children made gains in receptive vocabulary in all conditions herein may have a reassuring implication for parents: Children are adept at learning new vocabulary from a variety of reading activities.

Table 1

Mean Duration in Seconds (and Standard Deviations) of Book Reading Episodes in each Reading-Practice Condition

Reading Practice	Duration
Questioning	450.00 (16.64)
Recasting	420.75 (4.74)
Word Repetition	423.00 (14.88)
Verbatim Reading	392.25 (8.00)

Table 2

Mean Number of Words Correct (and Standard Deviations) on the Receptive Vocabulary Tests for each Age Group

Age	Test		
	Pretest	Immediate Posttest	Delayed Posttest
4	1.60 (1.24)	2.93 (1.60)	3.50 (1.47)
5	1.76 (1.61)	3.53 (1.92)	4.34 (1.92)

Note. The mean number of words are out of a maximum of ten.

REFERENCES

Anderson, A. B., Teale, W. H., & Estrada, E. (1980). Low-income children's preschool literary experiences: some naturalistic observations. The Quarterly Newsletter of the Laboratory of Comparative Human Cognition, 2, 59-65.

Anglin, J. M. (1977). Word, object, and conceptual development. New York: Norton.

Baker, N. D., & Nelson, K. E. (1984). Recasting and the related conversational techniques for triggering syntactic advances by young children. First Language, 5, 3-22.

Bonners, S. (1989). Just in passing. New York: Lothrop, Lee, & Shepard Books.

Buium, N., & Turnure, J. E. (1977). A cross-cultural study of verbal elaboration productivity and memory in young children. Child Development, 48, 296-300.

Carey, S. (1978). The child as word learner. In M. Halle, J. Bresnan, & G. A. Miller (Eds.), Linguistic Theory and Psychological Reality (pp. 264-293). Cambridge, MA: MIT Press.

Chomsky, C. (1972). Stages in language development and reading exposure. Harvard Educational Review, 42, 1-33.

Clark, E. V. (1979). Building a vocabulary: Words for objects, actions, and relations. In P. Fletcher & M. Garman (Eds.), Studies in language acquisition (pp. 149-160). Cambridge, MA: Cambridge

University Press.

Clark, E. V. (1983). Meanings and concepts. In P. H. Mussen (Ed.), Handbook of child psychology (4th ed.): Vol. 3. Cognitive development (pp. 787-840). New York: Wiley.

Clark, H. H., & Clark, E. V. (1977). Psychology and language: An introduction to psycholinguistics. New York: Harcourt Brace Jovanovich, Inc.

Clark, M. M. (1984). Literacy at home and at school: Insights from a study of young fluent readers. In J. Goelman, A. A. Oberg, & F. Smith (Eds.), Awakening to literacy (pp. 122-130). London: Heineman.

Cooper, A. J. R., & Monk, A. (1976). Learning for recall and learning for recognition. In J. Brown (Ed.), Recall and recognition (pp. 131-156). London: John Wiley & Sons.

Cornell, E. H., Sénéchal, M., & Broda, L. S. (1988). Recall of picture books by 3-year-old children: testing and repetition effects in joint reading activities. Journal of Educational Psychology, 80, 537-542.

Cross, T. G. (1978). Mothers' speech and its association with rate of linguistic development in young children. In N. Waterson & C. Snow (Eds.), The development of communication (pp. 199-216). New York: Wiley.

Danziger, K. (1957). The child's understanding of kinship terms: A study in the development of relational concepts. Journal of Genetic

Psychology, 91, 213-232.

DeLoache, J. S., & DeMendoza, O. A. P. (1987). Joint picture-book interactions of mothers and 1-year-old children. British Journal of Developmental Psychology, 5, 111-123.

Doake, D. (1981). Book experience and the emergent reading behaviour in young children. Unpublished doctoral dissertation, University of Alberta, Edmonton.

Dollaghan, C. (1985). Child meets word: "Fast mapping" in preschool children. Journal of Speech and Hearing Research, 28, 449-454.

Dunn, L., & Dunn, L. (1981). Peabody Picture Vocabulary Test-Revised. Circle Pines, MN: American Guidance Services, Inc.

Durkin, D. (1966). Children who read early. New York: Teacher's College Press.

Durkin. D. (1974-1975). A six year study of children who learn to read in school at the age of four. Reading Research Quarterly, 10, 9-61.

Eller, R. G., Pappas, C. C., & Brown, E. (1988). The lexical development of kindergartners: Learning from written context. Journal of Reading Behavior, 20, 5-23.

Elley, W. B. (1989). Vocabulary acquisition from listening to stories. Reading Research Quarterly, 24, 174-187.

Ellis, R., & Wells, G. (1980). Enabling factors in child adult discourse. First Language, 1, 46-62.

Feitelson, D., Kita, B., & Goldstein, Z. (1986). Effects of listening to series

stories on first graders' comprehension. Research in the Teaching of English, 20, 339-356.

Flood, J. (1977). Parental styles in reading episodes with young children. Reading Teacher, 30, 864-867.

Heath, S. B. (1980). The functions and uses of literacy. Journal of Communication, 30, 123-133.

Heath, S. B. (1982). What no bedtime story means: Narrative skills at home and school. Language in Society, 11, 46-76.

Hoff-Ginsberg, E. (1986). Function and structure in maternal speech: Their relation to the child's development of syntax. Developmental Psychology, 22, 1-13.

Holdaway, D. (1979). The foundations of literacy. Sydney: Ashton Scholastic.

Holdaway, D. (1984). Stability and change in literacy learning. London, Ontario: The University of Western Ontario.

Hollingshead, A. B. (1975). Four factor index of social status. Unpublished manuscript, Yale University, Department of Sociology, New Haven.

Irwin, O. (1960). Infant speech: Effects of systematic reading of stories. Journal of Speech and Hearing Research, 3, 187-190.

Just, M. A., & Carpenter, P. A. (1987). The psychology of reading and language comprehension. Boston: Allyn and Bacon, Inc.

Kučera, H., & Francis, W. N. (1967). Computational analysis of

present-day American English. Providence, RI: Brown University Press.

Mason, J. M., & Allen, J. (1986). A review of emergent literacy with implications for research and practice in reading. In E. Z. Rothkopf (Ed.), Review of research in education: Vol. 13. (pp. 3-47). Washington, DC: American Educational Research Association.

Miller, G. E., & Pressley, M. (1987). Partial picture effects on children's memory for sentences containing implicit information. Journal of Experimental Child Psychology, 43, 300-310.

Moon, C., & Wells. G. (1979). The influence of the home on learning to read. Journal of Research in Reading, 2, 53-62.

Morrow, L. M. (1983). Home and school correlates of early interest in literature. Journal of Educational Research, 76, 221-230.

Morrow, L. M. (1984). Reading stories to young children: Effects of story structure and traditional questioning strategies on comprehension. Journal of Reading Behavior, 16, 273-288.

Morrow, L. M. (1988). Young children's responses to one-to-one story reading in school settings. Reading Research Quarterly, Winter, 89-107.

Murdock, B. B. (1963). An analysis of the recognition process. In C. N. Cofer & B. S. Musgrave (Eds.), Verbal behavior and learning: Problems and processes (pp. 10-21). New York: McGraw-Hill.

Nelson, K. E. (1977). Facilitating children's acquisition of syntax.

Developmental Psychology, 13, 101-107.

Nelson, K. E. (1981). Toward a rare-event cognitive comparison theory of syntax acquisition. In P. S. Dale & D. Ingram (Eds.), Child language: An international perspective (pp. 229-240). Baltimore: University Park Press.

Nelson, K. E., Denninger, M. M., Bonvillian, J. D., Kaplan, B. J., & Baker, N. D. (1984). Maternal input adjustments and non-adjustments as related to children's linguistic advances and the language acquisition theories. A. D. Pelligrini & T. D. Yawkey (Eds.), The development of oral and written language: Readings in development and applied linguistics (pp. 31-56). New York: Ablex.

Ninio, A. (1980). Picture book reading in mother-infant dyads belonging to two subgroups in Israel. Child Development, 51, 587-590.

Ninio, A., & Bruner, J. S. (1978). The achievement and antecedents of labeling. Journal of Child Language, 5, 1-15.

Pelligrini, A. D., Perlmutter, J. C., Galda, L., & Brody, G. H. (1990). Joint book reading between Black Head Start children and their mothers. Child Development, 61, 443-453.

Pemberton, E. F., & Watkins, R. V. (1987). Language facilitation through stories: Recasting and modeling. First Language, 7, 79-89.

Pressley, M., & Forrest-Pressley, D. (1985). Questions and children's cognitive processing. In A. C. Graesser & J. B. Black (Eds.), The psychology of questions (pp. 277-296). Hillsdale, NJ: Lawrence

Erlbaum Associates.

Read, C. (1980). What children know about language: Three examples. Language Arts, 57, 144-148.

Roser, N., & Martinez, M. (1985). Roles adults play in preschoolers response to literature. Language Arts, 62, 485-490.

Runquist, W.N. (1966). Verbal behavior. In J. B. Sidowski (Ed.), Experimental method and instrumentation in psychology (pp. 487-540). New York: McGraw-Hill.

Runquist, W.N. (1983). Some effects of remembering on forgetting. Memory and Cognition, 11, 641-650.

Snow, C. E. (1983). Literacy and language: Relationships during the preschool years. Harvard Educational Review, 53, 165-189.

Snow, C. E., & Goldfield, B. A. (1983). Turn the page please: Situation-specific language learning. Journal of Child Language, 10, 551-569.

Snow, C. E., & Ninio, A. (1986). The contracts of literacy: What children learn from learning to read books. In Teale, W. H., & Sulzby, E. (Eds.), Emergent literacy: Writing and reading (pp. 116-138). Norwood, NJ: Ablex.

Spiedel, G. E., & Nelson, K. E. (1989). A fresh look at imitation in language learning. In G. E. Spiedel & K. E. Nelson (Eds.), The many faces of imitation in language learning (pp. 1-21). New York: Springer-Verlag.

Stevenson Abbate, M., & Bartell Lachapelle, N. (1979). Pictures please: A language supplement. Tucson, AR: Communication Skill Builders, Inc.

Sulzby, E. (1985). Children's emergent reading of favorite storybooks: A developmental study. Reading Research Quarterly, 20, 458-481.

Sutton, M. H. (1964). Readiness for reading at the kindergarten level. The Reading Teacher, 17, 234-240.

Teale, W. H. (1978). Positive environments for learning to read: what studies of early readers tell us. Language Arts, 55, 922-932.

Teale, W. H. (1981). Parents reading to their children : What we know and need to know. Language Arts, 58, 902-928.

Teale, W. H. (1982). Towards a theory of how children learn to read and write naturally. Language Arts, 59, 555-570.

Teale, W. H. (1984). Reading to young children: Its significance for literacy development. In Goelman, H., Oberg, A., & Smith, F. (Eds.), Awakening to Literacy (pp. 110-121). London: Heineman.

Teale, W. H., & Sulzby, E. (1986). Emergent literacy as a perspective for examining how young children become writers and readers. In W. H. Teale & E. Sulzby (Eds.), Emergent literacy: Writing and reading (pp. vii-xxv). Norwood, NJ: Ablex.

Templin, M. (1957). Certain language skills in children. Minneapolis: University of Minnesota Press.

Turnure, J. E., Buium, N., & Thurlow, M. L. (1976). The effectiveness of

interrogatives for promoting verbal elaboration productivity in young children. Child Development, 47, 851-855.

Valdez-Menchaca, M. C., & Whitehurst, G. J. (1988). The effects of incidental teaching on vocabulary acquisition by young children, Child Development, 59, 1451-1459.

Vygotsky, L. S. (1978). Mind in society: The development of psychological processes. Cambridge, MA: Harvard University Press.

Watson, R. (1989). Literate discourse and cognitive organization: Some relations between parents' talk and 3-year-olds' thought. Applied Psycholinguistics, 10, 221-236.

Wells, G. (1985). Language development in the preschool years. New York: Cambridge University Press.

Wells, G. (1986). The meaning makers: Children learning language and using language to learn. Portsmouth, NH: Heineman.

Wheeler, P. (1983). Context-related age characteristics in mothers' speech: Joint book reading. Journal of Child Language, 10, 259-263.

Whitehurst, G. J., & DeBaryske, B. D. (1989). Observational learning and language acquisition: Principles of learning, systems, and tasks. In G. E. Spiedel & K. E. Nelson (Eds.), The many faces of imitation in language learning (pp. 251-276). New York: Springer-Verlag.

Whitehurst, G. J., Falco, F. L., Lonigan, C. J., Fischel, J. E., DeBaryske, B. D., Valdez-Menchaca, M. C., & Caufield, M. (1988). Accelerating

language development through picture book reading. Developmental Psychology, 24, 552-559.

Whitehurst, G. J., Fischel, J. E., Arnold, D., Lonigan, C. J., Valdez-Menchaca, M. C., & Caufield, M. (1989, April). Intervening in early shared book reading: Scripts vs. direct training. In G. J. Whitehurst (Chair), Winnie the Pooh and a language lift too: The effects of joint picture book reading. Symposium presented at the biennial meeting of the Society for Research in Child Development, Kansas City.

Whitehurst, G. J., & Valdez-Menchaca, M. C. (1988). What is the role of reinforcement in early language acquisition. Child Development, 59, 430-440.

Wood, D. J., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. Journal of Child Psychology and Psychiatry, 17, 89-100.

Wood, E., Pressley, M., Turnure, J. E., & Walton, R. (1987). Enriching recall of picture-dictionary definitions with interrogation and elaborated pictures. Educational Communication and Technology, 35, 43-52.

Appendix

This is the text constructed for the picture-book Just in Passing (Bonners, 1989). Note that target words are underlined, synonyms are in parentheses, and the wh-questions are in italics. Only in the recasting condition did the reader repeat the sentence introducing the target words but replacing the target word by its synonym. Only in the questioning condition did the reader ask the questions in italics.

When an illustration is skipped, it means that it was covered with a white index card. The decimals indicate the location of illustrations on the page (in the case of more than one illustration); the order starts from the upper left corner and moves in a clockwise fashion.

p 1 This is my street.

p 2 I see my friend Zach. Zach is an infant (baby). *What is Zach?*

p 3 Mrs. Smith is looking at Zach. Mrs. Smith an elderly (old) lady. *What kind of lady is Mrs. Smith?*

p 4-5 Zach is yawning. A big yawn. Mrs. Smith is surprised.

p 6 Zach's mom wants some fru.

p 7.1 This is is Fred. Fred sells newspapers. Now, Mrs. Smith is yawning just like Zach.

p 7.2 This is Harry.

p 8.1 Now Fred is yawning, just like Mrs. Smith and just like Zach.

p 8.2 Harry is surprised.

p 8.3 Harry is going to work.

p 8.4 Harry yawns and Timmy is surprised.

p 9.1 Here he is crossing the street.

p 9.2 And now Timmy's yawning too.

p 9.3 Bill sees Timmy yawn.

p 10.1 This is Zoe the cat. Zoe the cat is reposing (resting). *What is Zoe the cat doing?* Zoe the cat looks at Bill who is now yawning.

p 10.2 Right away Zoe the cat yawns.

p 11.1 It's a big fat yawn. Mary sees Zoe the cat yawn.

p 11.2 After washing the glass, Mary pushes up the sash (window). *What is Mary pushing up?*

p 11.3 And now it's Mary who yawns. There she is. Susie sees Mary yawn. And guess what?

p 12 Skip.

p 13 Now it's Susie's turn to yawn. A yawn so big that she closes her eyes. George is a lineman (telephone man). *What is George?* George sees Susie yawn and he's surprised.

p 14-15 George is climbing the pole.

p 16.1 Oh! Look at this. Now it's George's turn to yawn. A round yawn.

p 16.2 Mr. Brown is looking at George over there.

p 17.1 Then Mr. Brown has a funny feeling.

p 17.2 And he begins to yawn just like all the others. Everybody is yawning.

p 17.3 This is Arthur. Arthur is angling (fishing). *What is Arthur doing?* Arthur sees Mr. Brown yawn over on the bridge.

p 18 This is Ann the painter. Her brushes are in her satchel (purse). Ann sees Arthur yawn.

p 19.1 Right away Ann yawns.

p 19.2 Princess sees Ann yawn.

p 20.1 Princess is going to the zoo.

p 20.2 She open her mouth really big; even Princess is yawning.

p 21.1 The farmer feels something coming.

p 21.2 Ed sees the farmer yawn.

p 22.1 Ed is going to feed Martha the hippo.

p 22.2 Ed is yawning.

p 22.3 Skip.

p 23.1 Wow! Martha the hippo is now yawning. This is the biggest yawn ever. At that very moment, Alfred takes a photo.

p 23.2 Skip.

p 24.1 Skip.

p 24.2 Alfred shows Lorri the snapshot (picture). *What is Alfred showing?* Martha the hippo is yawning.

p 24.3 Lorri is also yawning. Louise sees Lorri yawn, and now she's yawning.

p 24.4 Skip.

p 25 Mark sees Louise yawn.

p 26.1 Mark is going home.

p 26.2 Halfway home, Mark yawns too. Jim sees Mark yawn.

p 27 Now, Jim is yawning. This is Rob.

p 28.1 Rob is gazing (looking) at Jim. *What is Rob doing?*

p 28.2 Skip.

p 28.3 Rob is walking down the corridor (hall). *Where is Rob walking?* Rob is yawning. Andy sees Rob yawning.

p 28.4 It's Andy's turn to yawn. Traci sees Andy yawn.

p 29.1 The elevator is going down.

p 29.2 And down.

p 29.3 Out comes Tracy and she's yawning. Mike sees her.

p 29.4 Skip.

p 30 And now Mike is yawning just like all the others. But this is Zach. Zach sees Mike yawn. Now what do you think? Will Zach yawn again?